

METHOD AND SYSTEM FOR IMPLEMENTING A SERVICE IN A  
TELECOMMUNICATION NETWORK

FIELD OF THE INVENTION

5 The present invention relates to telecommunication systems, in particular to services implemented in a digital multiple-service network.

BACKGROUND OF THE INVENTION

10 A known technique used in a digital multiple-service network, such as e.g. the ISDN network (ISDN, Integrated Services Digital Network), is transmission of information between two predetermined subscriptions using computers provided with PC cards applicable for  
15 ISDN B-channel data transfer. However, such a procedure requires the setup of a separate connection between the subscriptions in question.

Another prior-art method is e.g. the one described in specification FI 971716, whereby information is transmitted to a telecommunication terminal by a technique in which the terminal functions as a passive party only receiving information independently, without requiring any actions on the ISDN user's part. In this case, the information provider activates the  
25 transmission without the receiver's acknowledgement. This arrangement can be used to direct advertising, marketing or similar information to certain target groups e.g. according to the location of subscriptions, which can be determined on the basis of subscriber numbers or on some other corresponding basis.

Moreover, a previously known solution in the ISDN system is to implement services in a telephone exchange or as a separate intelligent network application. In the GSM network (GSM, Global System for Mobile Communications), interactive services are imple-

mented using short messages.

## BRIEF DESCRIPTION OF THE INVENTION

The object of the present invention is to disclose a new type of method and system which can be used to implement in the user's telecommunication terminal interactive services/supplementary services or services/supplementary services producing added value.

The invention concerns a method for implementing a service in a digital multiple-service network comprising an exchange, a first telecommunication terminal connected to the multiple-service network via a first interface and a second telecommunication terminal connected to the multiple-service network via a second interface. In the method, the service is implemented by using a server connected to the multiple-service network via a third interface. The service information is transmitted from the server to the second telecommunication terminal through channels reserved for signalling and using signalling protocols between terminals and exchange (DSS1) and between exchanges (ISUP) that comprise a limited amount of information not belonging to the call.

In a preferred embodiment of the invention, the service information is transmitted as a text message, in another embodiment in a suitable information element. The service information is transmitted using UUS signalling in one embodiment, USBS signalling in another embodiment. UUS signalling (UUS, User-to-User Signalling) is an ISDN network supplementary service which allows two-way flow of information between two telecommunication terminals. The information channel used a signalling channel connected to the terminals. The information is transmitted in the network transparently, i.e. the network makes no changes in the information content. Neither does the network interpret the information or carry out any actions based on it.

UUS signalling is described in ETSI (European Telecommunications and Standard Institute) standards of the ETS 300 286 series. USBS (User Signalling Bearer Service) is described e.g. in ETSI presentation prETS 300 5 716, the DSS1 protocol in recommendation draft EN 301 142 v.1.1.1 (1998-01). The text message is described in ETSI recommendation ETS 300 403.

In a preferred embodiment of the invention, a service provided by a server is distinguished by using 10 multiple subscriber numbering. Multiple subscriber numbering (MSN) is a numbering practice used in a multiple-service network as an ISDN supplementary service in which, in addition to a main number, a number of terminal-specific identification numbers are defined 15 for the basic subscriber interface. The other numbers differ only slightly from the main number, e.g. only the last digit is different. Multiple subscriber numbering is described in ETSI standards ETS 300 050, ETS 300 051 and ETS 300 052.

20 In an embodiment, a service provided by the server is distinguished by using subaddressing (SUB). Subaddressing is an ISDN supplementary service that allows the receiver of a call to expand his addressing capacity beyond a single ISDN network number. Subaddressing is described e.g. in ETSI standards ETS 300 25 059, ETS 300 060 and ETS 300 061.

In an embodiment of the method of the invention, the service is used to indicate telephone book information to a telecommunication terminal. The telephone book information presents e.g. the names and addresses of subscription holders in a telephone network, so the service can be used to make queries to 30 obtain information from the telephone book.

35 In a preferred embodiment, the service is used to indicate A-party telephone book information to the B-party's telecommunication terminal. In this case, preferably from the B-party's telecommunication

terminal a Facility message is sent to the exchange, a query for telephone book information regarding the A-party is sent from the exchange to the server and the telephone book information is sent from the exchange 5 to the B-party's telecommunication terminal. In an embodiment, the above-described function is performed using an Information message. The Facility and Information messages are described in conjunction with the DSS1 protocol. The telephone book information is preferably stored in conjunction with the terminal, e.g. 10 in a terminal-specific list for later use.

Moreover, the invention concerns a method for transmitting the A-party's name to the B-party's telecommunication terminal in a digital multiple-service 15 network. The multiple-service network comprises an exchange, a first telecommunication terminal, which belongs to the A-party and is connected to the multiple-service network via a first interface, and a second telecommunication terminal, which belongs to the B-party and is connected to the multiple-service network 20 via a second interface.

In the method, a message comprising the A-party's telephone number is sent from the second telecommunication terminal to the exchange. This message 25 is used to request telephone book information regarding the A-party, said telephone book information is retrieved in the exchange and sent from the exchange to the second telecommunication terminal using channels reserved for signalling as well as a signalling 30 protocol between the terminals and the exchange and between exchanges that comprises a limited amount of information not belonging to the call.

The information between the second telecommunication terminal and the exchange is preferably 35 transmitted using a Facility message in one embodiment and an Information message in another embodiment. The transmission of the A-party's name to the B-party's

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telecommunication terminal is preferably activated from a menu in the second telecommunication terminal. The telephone book information is stored in conjunction with the terminal.

5 The invention also concerns a system for im-  
plementing a service in a digital multiple-service  
network comprising an exchange, a first telecommunica-  
tion terminal connected to the multiple-service net-  
work via a first interface and a second telecommunica-  
10 tion terminal connected to the multiple-service net-  
work via a second interface. The system of the inven-  
tion comprises a server connected to the multiple-  
service network via a third interface and means for  
transmitting service information between the server  
15 and the telecommunication terminal by using channels  
reserved for signalling and using a signalling proto-  
col between the terminals and the exchange and between  
exchanges that comprises a limited amount of informa-  
tion not belonging to the call.

20 In an embodiment, the system comprises means for transmitting service information in the form of a text message; in a preferred embodiment the system comprises means for transmitting service information in a suitable information element intended for the service in question. The system preferably comprises means for transmitting service information using UUS signalling; in an embodiment, the system comprises means for transmitting service information using USBS signalling.

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30 In an embodiment of the invention, the server comprises means for distinguishing a service by using multiple subscriber numbering in which, in addition to a main number, a number of terminal-specific identification numbers are defined for the basic subscriber interface. In an embodiment, the server comprises means for distinguishing a service via subaddressing. The system preferably comprises means for addressing

telephone book information to a telecommunication terminal.

The system preferably comprises means for addressing A-party telephone book information to the B-  
5 party's telecommunication terminal, permitting e.g. the A-party to see the name of the B-party.

In an embodiment, the B-party's telecommunication terminal comprises means for sending a Facility message to the exchange, the exchange comprises means  
10 for sending a query for A-party telephone book information to the server and means for sending telephone book information to the B-party's telecommunication terminal.

In an embodiment, the B-party's telecommunication terminal comprises means for sending an Information message to the exchange, the exchange comprises means for sending a query for A-party telephone book information to the server and means for sending telephone book information to the B-party's telecommunication terminal.  
20 The terminal preferably comprises means for storing telephone book information.

Moreover, the invention concerns a system for transmitting A-party telephone book information to a B-party's telecommunication terminal in a digital multiple-service network comprising an exchange, a first telecommunication terminal belonging to the A-party and connected to the multiple-service network via a first interface and a second telecommunication terminal belonging to the B-party and connected to the multiple-service network via a second interface.  
25 In the system, the second telecommunication terminal comprises means for sending a message to the exchange, said message comprising the A-party's number and requesting telephone book information regarding the A-party.  
30 The exchange comprises means for retrieving A-party telephone book information and means for sending

EP0475084B1

telephone book information to the second telecommunication terminal.

In the system, information is transmitted using channels reserved for signalling and a signalling protocol between terminals and exchange and between exchanges that comprises a limited amount of information not belonging to the call. In an embodiment, the system comprises means for transmitting information between the second telecommunication terminal and the exchange in a Facility message. The system preferably comprises means for transmitting information between the second telecommunication terminal and the exchange in an Information message. In an embodiment, the second telecommunication terminal comprises a menu for activating the transmission of A-party telephone book information. The menu may be e.g. a voice controlled menu or a visual menu used via the display of the telecommunication terminal. The telecommunication terminal preferably comprises means for storing telephone book information.

The invention makes it possible to utilize the fast and error-free data transmission and diversified signalling properties available in a multiple-service network. ISDN terminals are usually provided with large displays that make it easy to read even long messages via the terminal. By utilizing the invention, services need not be implemented in the telephone exchange; instead, a separate server connected to an interface can be used. If the modification of services or their activation in the exchange is performed sufficiently dynamically, e.g. via an analysis using different starting conditions, then services can be produced for the subscriber by simply modifying the server.

The invention also allows the subscriber to use various interactive services and services producing added value directly via a telecommunication ter-

5 minal, without a computer. The service can also be utilized with a combination of a computer and a tele-  
10 communication terminal, in which case the computer connected to the telecommunication terminal allows easier, more diversified and more efficient use of the service. If the terminal connected to the multiple-  
15 service network additionally implements e.g. a PCI/CAPI interface (Programmable Communication Interface for ISDN/Common Application Interface), then it will be possible and relatively easy for the user to produce highly versatile applications of his own. The terminal does not require a switched connection, i.e. a B-channel connection such as e.g. via the Internet; instead, the service uses D-channel signalling serv-  
20 ices. This means avoiding the call charges for a switched call; especially saving the call start charge is a great advantage. As it is not necessary to set up an Internet connection either, the corresponding costs are also avoided. The invention can be applied without modifications in many terminals in a multiple-service network because the terminals usually implement e.g. a UUS signalling service.

#### **LIST OF ILLUSTRATIONS**

25 In the following, the invention will be de-  
scribed by the aid of examples of its embodiments with  
reference to the drawings, wherein

Fig. 1 is a diagrammatic representation of a system according to the invention;

30 Fig. 2 presents a signalling scheme according to the invention;

Fig. 3 presents another signalling scheme according to the invention;

35 Fig. 4 presents a flow diagram representing a method according to the invention; and

Fig. 5 presents a flow diagram representing another method according to the invention.

#### DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 is a diagrammatic representation of a method according to the invention. The system comprises a digital multiple-service network ISDN and an exchange 3 belonging to the network. The ISDN network may comprise several exchanges, local and transfer exchanges. The exchanges are connected to each other using ISDN signalling (ISUP). Connected to the multiple-service network via a first interface 4 is a first telecommunication terminal TE1 and via a second interface 5 a second telecommunication terminal TE2.

In the examples, the first telecommunication terminal TE1 belongs to the A-party, in other words, the call is started from the first terminal TE1. The second telecommunication terminal TE2 belongs to the B-party, i.e. the receiver of the call. Using ISDN signalling (DSS1), the A-party communicates with the originating exchange and the B-party communicates with the terminating exchange. The originating and terminating exchanges may be the same. Moreover, the system comprises a server 1, which is connected to the multiple-service network via a third interface 6. The server may communicate with any exchange in the ISDN network. The A-party, B-party and server may be connected to the same exchange. The interfaces 4, 5, 6 may be basic rate or primary rate interfaces as defined in the ISDN system, e.g. of the form 2B+D or 30B+D.

By means of the server 1, a service allowing the user of terminal equipment to use interactive services or receive in his/her terminal other information affording added value is implemented in the multiple-service network. The system comprises means for transmitting information between the server and the exchange or terminal equipment using a UUS or USBS

service and/or in a suitable information element, and/or from the exchange to the user as a text message. These means comprise means for generating and sending a message, both in the telecommunication terminals, in the server and in the exchanges. Although in this example only two subscriber interfaces and only one exchange are presented, it is to be understood that the telephone network consists of a plurality of cells, subscriber interfaces and exchanges connected by links. It is also to be noted that ISDN is part of a telephone network which may comprise e.g. PSTN, PLMN/GSM and PSDN.

The above-mentioned methods for transmitting information have been standardized in the DSS1 (DSS1, 15 Digital Subscriber Signalling No. 1) and/or ISUP (ISDN User Part) signalling. The DSS1 protocol is described e.g. in ETSI recommendation draft EN 301 142 v.1.1.1 (1998-01). The terminals TE1 and TE2 and the server 1 comprise means for implementing the above-mentioned 20 functions. These means implement DSS1 signalling. The terminals TE1 and TE2 are provided with displays 2 to allow reading of messages and with keypads 7 to allow input of messages.

In addition, the server 1 comprises means by 25 which a service requested by a terminal is distinguished using multiple subscriber numbering. The service requested is identified by the last digit or digits of the telephone number or numbers addressed to the server. Further, the server 1 comprises means for 30 distinguishing the service by using subaddressing.

In one of the services provided by the server 1, the telephone book information concerning the holder of the subscriber interface for the first telecommunication terminal TE1 is addressed to the second 35 telecommunication terminal TE2. In this case, the server 1 comprises means for addressing telephone book information to a telecommunication terminal. Stored in

the server 1 is a database containing telephone book information. Moreover, the server 1 comprises means for carrying out database operations based on information received from a telecommunication terminal. In a 5 service provided by the server, A-party telephone book information is addressed to the telecommunication terminal of the B-party. In this case, the exchange 3 comprises means for retrieving A-party telephone book information, e.g. the name of the calling party, from 10 the server 1 and transmitting it to the second telecommunication terminal TE2, to the B-party.

In an embodiment, the second telecommunication terminal TE2 belonging to the B-party comprises a menu on the basis of which the query for the name is 15 performed. In this case, the second telecommunication terminal also comprises means for requesting telephone book information from the exchange 3 or the server 1. The terminal makes the request for telephone book information using a Facility message. Together with the 20 message, an invoke component is sent to enable the system to deliver the information to the terminal TE2. In other words, the data transfer is implemented using a new type of information element. The Facility message is described e.g. in ETSI standard ETS 300 196. 25 In one embodiment, the corresponding functionality is implemented using an Information message. The service can be implemented using several different DSS1 message sequences.

Fig. 2 presents a signalling scheme according 30 to the invention. In the example, the condition for starting the service is the number of the A-party TE1, on the basis of which the A-party's name is retrieved from the server 1 and sent to the B-party TE2. The A-party's telecommunication terminal TE1 sends a SETUP 35 message to the exchange 3, arrow 10, whereupon the exchange 3 connected to the ISDN network starts connecting the call between the first terminal and the second

terminal TE2. The exchange 3 may be any call control unit in the ISDN network, e.g. distributed in several parts of the network, such as originating, transfer or terminating exchange. In the ISDN network, both the 5 calling number, e.g. 123123, and the called number, e.g. 321321, are transmitted.

The call control system in the ISDN network exchange 3 detects that a service, in the present example indication of telephone book information, has 10 been activated for the B-party. The exchange 3 sends to the server 1 a SETUP message, arrow 11, to the number 112233 of the server 3, and the address "Telephone book" in a subaddress. In addition, the exchange 3 sends to the server 1 a UUS message requesting the 15 server 1 to retrieve the name corresponding to the calling party number from the telephone book. The server 1 sends to the exchange 3 an ALERTing message, arrow 12, and in the ALERTing message a UUI information element (UUI, User-to-User Information) stating 20 that it is retrieving information by the given search criteria.

The server 1 terminates the connection with the exchange 3 by sending a DISConnect message, arrow 25 13, with an UUI information element containing the A-party telephone book information, e.g. name and address. The exchange 3 sends to the B-party's telecommunication terminal TE2 a SETUP message, arrow 14, and the number of the A-party. The exchange 3 sends the A-party telephone book information to the B-party's 30 telecommunication terminal TE2 e.g. in the form of a text message (Display), using the UUS service or in a suitable DSS1 information element, such as e.g. "calling party name". The service can be used e.g. to transmit address information in commercial transactions 35 performed by telephone.

Fig. 3 presents a signalling scheme used in a situation where an interactive service is implemented

from the second telecommunication terminal TE2. The service used in the example is a telephone book application in which the user of terminal equipment can make free-form telephone book queries. However, the 5 format used to implement the query must be agreed beforehand between the service provider (server) and the user (subscriber) or it must be a commonly agreed/standardized format.

The telecommunication terminal TE2 sends a 10 UUI information element in a SETUP message via the ISDN network to the server 1, arrow 15. The message includes the number of the server 1, e.g. 112233, the subaddress "Telephone book" for indicating the service, and a UUS message "S:Pernu;E:S\*". The service 15 provider has made definitions such that the keyword "S" means surname and "E" means first name. In search functions, an asterisk \* represents a wild-card character. The user has generated the UUS message using the keypad and display comprised in the telecommunication 20 terminal TE2. By this search, the user is querying the telephone book to find all users with the surname "Pernu" and having a first name beginning with the letter "S".

The server 1 returns to the telecommunication 25 terminal TE2 an ALERTing message containing a UUI information element indicating that it is performing the requested search, arrow 16. The server 1 sends to the telecommunication terminal TE2 a DISConnect message, arrow 17, for disconnecting the call, and in this message 30 a UUI information element containing the requested information, e.g. "Pernu Sakari 123123 <crlf> Pernu Sari 321321".

Fig. 4 presents a flow diagram representing the steps comprised in a method according to the invention. At step 20, an A-party is making a call. The exchange detects that the A-party has a service activated, so the exchange connects the call to the 35

server, step 21. The server identifies the service for the A-party on the basis of multiple subscriber numbering or subaddressing, step 22. The server returns the service information to the exchange and further to 5 the A-party, step 23.

The flow diagram in Fig. 5 presents the steps comprised in another method according to the invention in a telephone book information service application. The execution of the method depends on whether the 10 telephone book information service has been activated at step 30. If the service has been activated, then the next step 31 will be executed, otherwise the application is stopped. At step 31, the B-party telecommunication terminal requests the exchange for A-party 15 telephone book information. The exchange retrieves the telephone book information entered for the A-party, step 32. The exchange sends the A-party telephone book information to the B-party, step 33. The telephone book information is stored in the B-party telecommunication terminal for later examination, step 34.

To sum up, let it be stated that the invention offers the user a new way of utilizing a telecommunication terminal in a multiple-service network. By applying the invention, e.g. services corresponding to 25 the short message services available in the GSM network can be provided for wired-network subscribers as well.

The invention is not restricted to the examples of its embodiments described above, but many 30 variations are possible within the scope of the inventive idea defined in the claims.